

VASCULAR FLORA OF HACKBERRY FLAT,  
FREDERICK LAKE, AND SUTTLE CREEK,  
TILLMAN COUNTY, OKLAHOMA

Bruce W. Hoagland<sup>1</sup> and  
Priscilla H.C. Crawford

*Oklahoma Biological Survey and  
Department of Geography  
University of Oklahoma  
111 East Chesapeake St.  
Norman, Oklahoma 73019, U.S.A.*

Phillip T. Crawford

*Oklahoma Biological Survey and  
Department of Botany and Microbiology  
University of Oklahoma  
111 East Chesapeake St.  
Norman, Oklahoma 73019, U.S.A.*

Forrest Johnson (deceased)

*Oklahoma Biological Survey  
University of Oklahoma  
111 East Chesapeake St.  
Norman, Oklahoma 73019, U.S.A.*

ABSTRACT

The objective of this study is to fill a floristic data gap for southwest Oklahoma. Based upon a review of the Atlas of the Flora of Oklahoma database, it was noted that Tillman County was floristically under-documented. This paper reports the results of an inventory of the vascular plants in Tillman County. A total of 371 taxa of vascular plants in 253 genera and 74 families were collected. The most species were collected from the families Asteraceae (65), Poaceae (67), and Fabaceae (25). There were 123 annual and 248 perennial species. Forty-one species of woody plants were present. Forty-two exotic species were collected representing 11% of the flora. A total of 266 previously unreported species were documented. Five species tracked by the Oklahoma Natural Heritage Inventory were located, none of which were Federally listed as threatened or endangered.

RESUMEN

El objetivo de este estudio es completar los datos florísticos del suroeste de Oklahoma. Basados en una revisión de la base de datos del Atlas of the Flora of Oklahoma, se percibió que el Tillman County estaba subdocumentado florísticamente. En este artículo se publican los resultados de un inventario de las plantas vasculares en Tillman County. Se colectaron un total 371 taxa de plantas vasculares de 253 géneros y 74 familias. La mayoría de las especies se colectaron de las familias Asteraceae (65), Poaceae (67), y Fabaceae (25). Había 123 especies anuales y 248 perennes. Estaban presentes cuarenta y una especies de plantas leñosas. Se colectaron cuarenta y dos especies exóticas que representan el 11% de la flora. Se documentan un total de 266 especies no citadas previamente. Se localizaron cinco especies con seguimiento por el Oklahoma Natural Heritage Inventory; ninguna de las cuales estaba listada federalmente como amenazada o en peligro.

INTRODUCTION

North American botany has had a long tradition of floristic exploration and inventory (Ertter 2000a). Nevertheless, floristic inventories are of continued

<sup>1</sup>corresponding author: (405)325-1985, e-mail, [bhoagland@ou.edu](mailto:bhoagland@ou.edu)

value for research, conservation, and management purposes (Palmer et al. 1995). For example, it has been recently documented that new taxa are discovered and described at a rate of 60 per year (Ertter 2000a). Inventories are also crucial to biogeographic research by filling gaps in the geographic distribution of taxa at all levels. Floristic inventories play a role in plant species conservation, both in locating populations of rare and/or undescribed species and bringing their presence to the attention of conservation organizations (Radford et al. 1980; Stuessy & Sohier 1996). The lack of accurate floristic data can jeopardize the long term persistence of sensitive species (Ertter 2000a). Finally, floristic inventories aid resource managers in locating populations of sensitive species and documenting the arrival of exotic and nuisance species (Barkley 2000). Ignorance of the presence of exotic species can be detrimental to sensitive species and/or exert adverse economic impacts (Ertter 2000b).

The objective of this study was to fill a gap in floristic data for southwest Oklahoma. Based on the Atlas of the Flora of Oklahoma database (AFO; Hoagland 2003), Tillman County is a floristically under-documented county. Prior to 1996, the year collecting began for this study, only 175 species were reported from Tillman County (Hoagland 2003). The first collection gathered in Tillman County was a specimen of *Eryngium diffusum* by G.W. Stevens on 17 October 1924. Peak years for plant collecting in Tillman County prior to this study were 1936 (30 specimens) and 1940 (45 specimens).

### Study Area

Tillman County (Fig. 1) occupies 237,503 hectares and is located within the Subtropical Humid (Cf) climate zone (Trewartha 1968). Summers are warm (mean July temperature = 28.9° C) and humid, and winters are relatively short and mild (mean January temperature = 3.5° C). Mean annual precipitation is 78.7 cm., with periodic severe droughts (Oklahoma Climatological Survey 2003). Physiographically, the study area is located in the Osage Plains section of the Central Lowlands province (Hunt 1974) and within the Central Redbed Plains province of Oklahoma (Curtis & Ham 1979). The surface geology of Tillman County is predominately red sandstone and shale formed from shallow-marine and alluvial deposits of Permian age (Branson & Johnson 1979).

There are eight soil associations in Tillman County (Lamar & Rhodes 1974). The two predominant soil associations are the Tipton-Hardeman-Grandfield, which occurs on the floodplains of the Red and North Fork of the Red River and is nearly level, loamy, sandy soil with loamy subsoil, and the Ford-Tillman, which is a nearly level to gently sloping upland, loamy soil with loamy and clay subsoils. The Clairemont-Asa-Miller Association occupies bottomlands and is deep, nearly level soil which is loamy, clayey throughout (Lamar & Rhodes 1974).

The predominant potential natural vegetation in Tillman County (Duck & Fletcher 1943) includes the Mixedgrass Eroded Plains, which would occupy

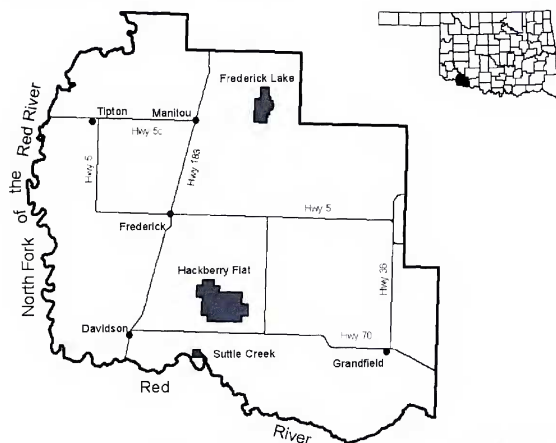


FIG. 1. Location of the three sites selected for floristic sampling in Tillman County, Oklahoma.

138,565 hectares (58%) on loamy soil and shallow rocky soil, and 68,635 hectares (29%) of tallgrass prairie (Duck & Fletcher 1943). Sandsage grassland occupies 10,360 hectares (4%) and occurs on deep sand deposits along the North Fork of the Red River, Red River, and Otter Creek. Mesquite grassland occupies 4,403 hectares (2%). Bottomland forest occupies 15,540 hectares (6%).

#### METHODS

Collections were made at three locations: Hackberry Flat Wildlife Management Area (HF), and Lake Frederick (LF), a municipal reservoir, and Suttle Creek (SC) a Bureau of Land Management (BLM) holding along the Red River (Table 1). At each of these locations, collection sites were established for intensive floristic sampling. Sites were selected following a review of U.S. Geological Survey 1:24,000 topographic maps and field reconnaissance. The predominant vegetation association at these sites was classified according to Hoagland (2000). Collections were also made randomly throughout each location and the county. Collections at HF were made from April to October, 1996, and at LF and SC from April through October 2000, from March through October 2001. Vouchers for exotic species (defined as those species not native to North America) were made

TABLE 1: Location and elevation data for sample sites. Coordinates represent the north and southern most latitude and the east and west most longitude of each study site. Coordinates are presented in decimal degrees.

Site	North	South	East	West	Max. Elev.	Min. Elev.
Frederick Lake	34.54°N	34.51°N	98.87°W	98.90°W	381m	360m
Hackberry Flat	34.30°N	34.25°N	98.89°W	98.98°W	366m	349m
Suttle Creek	34.23°N	34.22°N	98.96°W	98.97°W	358m	332m

from naturalized populations only, thus excluding cultivated and ornamental plants. Specimens were processed at the Robert Bebb Herbarium of the University of Oklahoma (OKL) following standard procedures. Manuals used for specimen identification included Waterfall (1973), Great Plains Flora Association (1986), and Diggs et al (1999). Origin, either native or introduced, was determined using Taylor & Taylor (1991) and USDA-NRCS (2003). Nomenclature follows the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS 2003). A voucher set was deposited at OKL. Sorensens' Index of Similarity (Pielou 1984) was calculated for pairs of sites in order to determine similarity of floras.

#### RESULTS AND DISCUSSION

A total of 371 taxa of vascular plants in 74 families and 253 genera were collected in Tillman County. Among the angiosperms, 97 were monocots and 270 were dicots. In addition, one fern ally and one gymnosperm was recorded. The Asteraceae (65), Poaceae (67), and Fabaceae (25) had the greatest number of species. Genera with the greatest number of species were *Dalea* (6), *Cyperus* (5), *Panicum* (5) and *Bromus* (4). One hundred and twenty-three species were annuals and 248 were perennials. Forty-one species of woody plants were collected: 20 trees, 13 shrubs, and 8 woody vines.

Forty-two introduced species (11% of the flora) were collected in Tillman County. This is comparable to the number of exotics collected at the Chickasaw National Recreation, located in south-central Oklahoma, where 12% of the flora was composed of exotic species (Hoagland & Johnson 2001). The families with the greatest number of introduced species were Poaceae (17), Brassicaceae (5), and Asteraceae (4). Genera with the most exotic species were *Bromus* (4) and *Echinochloa* (3). Species tracked by the Oklahoma Natural Heritage Inventory (ONHI) were *Abronia fragrans* (G5, S2S3), *Argythamnia humilis* (G5, S2S3), *Cenchrus echinatus* (G5, S1), *Escobaria vivipara* (G5, S2S3), and *Malvella leprosa* (G5, S1S2). Species are ranked according to level of imperilment at the state (S) and global (G) levels on a scale of 1-5; 1 representing a species that is imperiled and 5 one that it is secure (Groves et al. 1995). No Federally listed threatened or endangered species were encountered.

Species richness was highest at LF (Table 2) and lowest at HF, which was by far the largest site (Table 3). The low species richness may be due to the fact that 97% of the land cover was classified as disturbed. Although LF was smaller in area than HF, which had the lowest species richness, there were more habitat types present. SC, which had the second lowest species richness, was 65% disturbed (Table 3). LF was only 10% disturbed. However, the number of annual species, which often indicates the degree of disturbance, was highest at LF, not HF.

Although all three sites were in close geographic proximity, Sorensen Indices were below 0.5 (Table 4). The highest similarity was scored for the comparison of HF and LF, which shared 53 species (Table 5). The high number of arenaceous species at SC may account for the low similarity index values between that site and the other two. Interestingly, the highest similarity was between the largest sites.

The AFO database (Hoagland 2003) lists 175 species for Tillman County that were collected prior to 1996. Seventy species in the Atlas database were not collected in this study. There were eight families in the AFO database that were not collected in this study; Acanthaceae (*Dyschoriste linearis* and *Justicia americana*), Apocynaceae (*Apocynum cannabinum*), Cuscutaceae (*Cuscuta cuspidata*), Dryopteridaceae (*Woodsia obtusa*), Fumariaceae (*Corydalis aurea*), Polemoniaceae (*Ipomopsis longiflora*), and Pteridaceae (*Pellaea atropurpurea*). Of the remaining species, 107 were reported both in AFO database and in this study. When that number is subtracted from the total of species in the checklist, this study contributed 266 species previously unreported from Tillman County. When the species unique to the AFO and this study are summed, along with the number of shared species, this gives a total of 441 species in Tillman County, a 40% increase in our previous knowledge.

Seven habitat types were found at the three primary collecting sites (Table 2). The actual number of habitat types at each site ranged from 3 to 6. A brief description of each habitat type follows.

### **Sandbars and dunes (SB)**

Sandbars and dunes occurred only at the SC site. Vegetation on sandbars, which were in the Red River channel, was sparse, however *Cyperus esculentus*, *Heliotropium curassavicum*, and *Tamarix chinensis* were present. Sandunes, which occurred along the floodplain and terraces of the Red River, were vegetated by the *Artemisia filifolia*/*Sporobolus cryptandrus*-*Schizachyrium scoparium* shrubland association (Hoagland 2000). Associated species included *Dalea villosa*, *Prunus angustifolia*, *Calylophus serrulatus*, *Eriogonum anuum*, *Sideroxylon lanuginosa*, *Rhus aromatica*, *Vitis acerifolia*, and *Zanthoxylum hirsutum*. Tracked species found in this habitat type were *Abronia fragrans* and *Cenchrus echinatus*.

TABLE 2: Summary of floristic collections at three sites in Tillman County, Oklahoma. Format follows Palmer et al. (1995).

Taxonomic group	Species	Native spp.	Introduced spp.
Hackberry Flat			
Coniferophyta	0	0	0
Magnoliophyta			
Magnoliopsida	86	75	11
Liliopsida	35	25	10
<b>Total</b>	121	100	21
Lake Frederick			
Coniferophyta	1	1	0
Magnoliophyta			
Magnoliopsida	144	130	14
Liliopsida	41	35	5
<b>Total</b>	185	166	19
Suttle Creek			
Coniferophyta	1	1	0
Magnoliophyta			
Magnoliopsida	127	119	8
Liliopsida	54	45	9
<b>Total</b>	182	165	17

TABLE 3: Habitat types mapped at the three primary collection sites in Tillman County, Oklahoma. Area = total area of the site, HT = number of habitat types at the site, SB = sandbars and dunes, AQ = aquatic, DA = Old fields and disturbed areas, PS = pasture, MG = mixedgrass prairie, MQ = mesquite shrubland, and BLF = bottomland forest. (HF = Hackberry Flat Wildlife Management Area, LF = Lake Frederick, SC = Suttle Creek). All values are reported in hectares.

Site	Area	HT	SB	AQ	DA	PS	MG	MO	BLF
HF	2,770	0	0	2,690	67	14	0	0	
LF	911	6	0	341	95	0	0	441	26
SC	161	5	17	9.6	105	0	0.1	0	28

TABLE 4: Sorensens' Index of Similarity values for three collection sites, Tillman County, Oklahoma (HF = Hackberry Flat Wildlife Management Area, LF = Lake Frederick, SC = Suttle Creek).

	Suttle Creek	Lake Frederick	Hackberry Flat
Suttle Creek	1	0.347	0.275
Hackberry Flat		0.352	1

TABLE 5: An inter-site comparison of shared species in Tillman County, Oklahoma. Unique refers to species found only at the site listed. W/ = species shared with two sites.

Site	Total	Unique	w/LF	w/HF
Hackberry Flat	121	45		
Lake Frederick	185	87		53
Suttle Creek	182	88	63	41

### Aquatic and wetland habitats (AQ)

Aquatic habitats were found at LF and SC. Aquatic environments at LF were composed of the 341 hectare Lake Frederick and its shoreline. Vegetated areas were on the upper reaches of the lake, where the *Polygonum pensylvanicum*-*P. lapathifolium* herbaceous association (Hoagland 2000) was common. Associated species included *Eleocharis palustris*, *Juncus torreyi*, *Potamogeton pectinatus*, *Schoenoplectus pungens*, and *Xanthium strumarium*.

Wetlands at SC were formed by seeps and springs that emerged at the base of sand dunes and flowed into Suttle Creek. The vegetation in the seeps and springs was best characterized as the *Rorippa nasturtium-aquaticum* herbaceous association (Hoagland 2000). Associated species included *Eclipta prostrata*, *Hydrocotyle verticillata*, *Lobelia cardinalis*, *Ludwigia palustris*, *Myosurus minimus*, and *Ranunculus scleratus*.

Along broader stretches of Suttle Creek, the *Schoenoplectus americanus* - *Eleocharis* spp. herbaceous association (Hoagland 2000) was predominant. Associated species included *Amorpha fruticosa*, *Cephalanthus occidentalis*, *Distichlis spicata*, *E. palustris*, *J. torreyi*, *Polypogon monspeliensis*, *Symphotrichum subulatum* and *Typha domingensis*.

### Disturbed areas and old fields (DA)

Disturbed areas occurred at all three sites and was the predominant cover type at HF and SC. Disturbed area designations included mowed lawns, roadsides, and other sites exhibiting signs of physical disruption. Common plants in disturbed areas included *Bothriochloa ischaemum*, *Cynodon dactylon*, *Daucus pusillus*, *Melilotus officinalis*, and *Mollugo verticillata*. Old-fields were characterized by *Ambrosia trifida*, *Amaranthus rudis*, *Cnidoscolus texanus*, *Conyza canadensis*, and *Sorghum halepense*. *Malvella leprosa* was the only species tracked by ONHI found in this habitat type.

### Pasture (PS)

This habitat type occurred only at HF, where *B. ischaemum* had been planted on 67 ha in the northwest corner of the site. The pasture was essentially a monoculture of *B. ischaemum* with a few widely scattered individuals of *Prosopis glandulosa*.

### Mixedgrass prairie (MG)

Mixedgrass prairie occurred at all three sample sites, but was most extensive at LF. *Bouteloua hirsuta* - *Bouteloua curtipendula* herbaceous association was common on coarse, shallow soils. Associated species included *Aristida purpurascens*, *Bouteloua rigidiseta*, *Cratogeomys elliptica*, *Leucelene asteroides*, *Lithospermum tenellum*, *Opuntia phaeacantha*, *Schizachyrium scoparium*, and *Thelesperma filifolia* (Hoagland 2000, Crawford 2002). On loamy soils, the *Schizachyrium scoparium* - *Sorghastrum nutans* herbaceous association predominates. Common associates include *Andropogon gerardii*, *A. purpurascens*, *Bouteloua curtipendula*, *Panicum virgatum*, *Sporobolus cryptandrus*, and *Symphyotrichum ericoides*. *Argythamnia humilis* and *Escobaria vivipara* were found in this habitat type and also in mesquite shrubland.

### Mesquite shrubland (MQ)

This habitat type, representing the *Prosopis glandulosa*/ *Bouteloua* sp. shrubland association (Hoagland 2000), was found only at LF. Unlike *P. glandulosa* shrublands throughout Tillman County, the herbaceous vegetation at LF was predominantly native species (Crawford 2002). Dominant grasses included *Bouteloua curtipendula* and *Schizachyrium scoparium*. Associated species included *Aristida purpurascens*, *Bouteloua rigidiseta*, *Echinacea angustifolia*, *Erioncureon pilosum*, *Eryngium leavenworthii*, *Opuntia phaeacantha*, *Sorghastrum nutans*, *Sporobolus cryptandrus*, *Symphyotrichum ericoides*, and *Thelesperma filifolia*.

### Bottomland forest (BLF)

Bottomland forest occurred at LF and SC. Two vegetation types occurred in this category: *Fraxinus pennsylvanica* - *Ulmus americana* forest association and the *Populus deltoides*/ *Salix* (*exigua*, *nigra*) forest association (Hoagland 2000). Associated species included *Ampelopsis cordata*, *Celtis laevigata*, *Teucrium canadense*, and *Toxicodendron radicans*.

### ANNOTATED CHECKLIST

Annotated species list for Tillman County, Oklahoma. The first entry is the collection number (the prefix **BLM** = Suttle Creek, a Bureau of Land Management holding on the Red River, **HF** = Hackberry Flat Wildlife Management Area, and **PC** = Lake Frederick). Specimens with the prefix **M9** or the suffixes **BWH** or **98** represent specimens collected outside the three areas inventoried), followed by origin (**N** = native, **I** = introduced), life history (**A** = annual, **Bi** = biennial, **P** = perennial), and habitat (**SB** = sandbars and dunes, **AQ** = aquatic, **DA** = Old fields and disturbed areas, **PS** = pasture, **MG** = mixedgrass prairie, **MQ** = mesquite shrubland, and **BLF** = bottomland forest). Voucher specimens were deposited at the Robert Bebb Herbarium at the University of Oklahoma (OKL).



**EQUISETOPHYTA****EQUISETACEAE**

*Equisetum laevigatum* A. Braun; M9:134; N; P; AQ

**CONIFEROPHYTA****CUPRESSACEAE**

*Juniperus virginiana* L.; BLM0179, PC-138; N; P; DA, MG

**MAGNOLIOPHYTA-LILIOPSIDA****AGAVACEAE**

*Yucca glauca* Nutt.; BLM064; N; P; MG

**ALISMATACEAE**

*Sagittaria brevirostra* Mackenzie & Bush; BLM0348; N; P; AQ

**CYPERACEAE**

*Carex tetrastachya* Scheele; BLM033, HF032; N; P; AQ

*Carex perdentata* S.D. Jones; BLM045; N; P; AQ

*Cyperus acuminatus* Torr. & Hook. ex Torr.; HF0158; N; P; DA

*Cyperus squarrosus* L.; 0119-90; N; A; AQ

*Cyperus croceus* Vahl; PC-168; N; A; DA

*Cyperus esculentus* L.; HF0151; I; P; DA

*Cyperus odoratus* L.; BLM0427; N; P; DA

*Eleocharis montevidensis* Kunth; BLM031, N; P; AQ

*Eleocharis palustris* (L.) Roem. & Schult.; HF0019, PC-135; N; P; AQ

*Fuirena simplex* Vahl; BLM0357; N; P; AQ

*Schoenoplectus americanus* (Pers.) Volk ex Schinz & R. Keller; BLM067; N; P; AQ

*Schoenoplectus pungens* (Vahl) Palla. var. *longispicatus* (Britton) S.G. Sm.; PC-133; N; P; AQ

*Schoenoplectus maritimus* (L.) Lye; BLM0451; N; P; AQ

**IRIDACEAE**

*Nemastylis geminiflora* Nutt.; PC-2; N; P; DA, MG  
*Sisyrinchium angustifolium* P. Mill.; HF065; N; P; DA, MG

*Sisyrinchium chilense* Hook.; PC-16; N; P; DA

**JUNCACEAE**

*Juncus marginatus* Rostk.; M9:132; N; P; AQ

*Juncus torreyi* Cov.; BLM0355, PC-132; N; P; AQ

**LILIACEAE**

*Allium canadense* L.; BLM0076; N; P; DA, MG

*Cooperia drummondii* Herbert; HF0141; N; P; MG

*Erythronium albidum* Nutt.; PC-232; N; P; BLF

*Nothoscordum bivalve* (L.) Britton; HF0166, PC-68; N; P; DA, MG, MQ

**NAJADACEAE**

*Najas guadalupensis* (Spreng.) Magnus; 2085-BWH; N; A; AQ

**POACEAE**

*Aegilops cylindrica* Host; HF051; I; A; AQ

*Andropogon gerardii* Vitman; BLM0435, PC-200; N; P; MG, MQ

*Andropogon glomeratus* (Walt.) B.S.P.; BLM0424; N; P; AQ, BLF

*Aristida purpurascens* Poir.; BLM0369; N; P; DA, MG

*Aristida purpurea* Nutt.; BLM0161, HF0104, PC-27; N; P; DA, MG

*Bothriochloa ischaemum* (L.) Keng var. *songarica* (Rupr. ex Fisch. & C.A. Mey.) Celarier & Harlan; HF0139, PC-22; I; P; DA, PS

*Bothriochloa saccharoides* (Sw.) Rydb.; HF047, PC-60; N; P; DA, MG, MQ

*Bouteloua curtipendula* (Michx.) Torr.; BLM0363, HF0105, PC-172; N; P; MG, MQ

*Bouteloua hirsuta* Lag.; PC-173; N; P; MG, MQ

*Bouteloua rigidisetia* (Steud.) A. S. Hitchc.; BLM0180, HF060, PC-21; N; P; MG, MQ

*Bromus catharticus* Vahl; BLM046, HF036, PC-63; I; P; BLF, DA, MQ

*Bromus commutatus* Schrad.; PC-46; I; A; DA

*Bromus japonicus* Thunb. ex Murr.; BLM0509, HF01; I; A; DA, MQ

*Bromus secalinus* L.; HF09; I; A; DA

*Buchloe dactyloides* (Nutt.) Engelm.; BLM051, HF02, PC-61; N; P; DA, MG, MQ

*Cenchrus echinatus* L.; BLM0322; N; A; SB

*Chloris cucullata* Bisch.; BLM0183; N; P; SB

*Chloris verticillata* Nutt.; HF0103; N; P; DA, MG, MQ

*Cynodon dactylon* (L.) Pers.; BLM0432, HF0100, PC-128; I; P; DA, PS

*Digitaria sanguinalis* (L.) Scop.; BLM0450; N; A; DA

*Distichlis spicata* (L.) Greene; BLM0312; N; P; AQ, SB

*Echinochloa colona* (L.) Link; BLM0434; I; A; AQ

*Echinochloa crus-galli* (L.) Beauv.; BLM0431; I; A; AQ

*Echinochloa crus-pavonis* (H.B.K.) Schult. var. *macera* (Wieg.) Gould; PC-194; I; A; AQ

*Echinochloa muricata* (Beauv.) Fern.; HF0101; N; A; AQ

*Elymus canadensis* L.; PC-114; N; P; BLF, MG, MQ

*Elymus virginicus* L.; BLM0147, HF0110; N; P; MG, MQ  
*Eragrostis cilianensis* (All.) Vign. ex Janchen;  
 BLM0328, HF0168; I; A; DA  
*Eragrostis hirsuta* (Michx.) Nees; BLM0449; N; P;  
 DA, MG, SB  
*Eragrostis hypnoides* (Lam.) B.S.P.; HF078; N; A; AQ  
*Eragrostis sessilis* Buckl.; PC-76; N; P; DA  
*Eriochloa contracta* Hitchc.; HF0126; N; A; DA, MG  
*Eriochloa sericea* (Scheele) Munro ex. Vasey; PC-  
 71; N; P; DA, MG  
*Erioneuron pilosum* (Buckley) Nash; BLM028, PC-  
 59; N; P; MG  
*Hordeum pusillum* Nutt.; BLM044, HF042, PC-29;  
 N; A; DA  
*Leersia oryzoides* (L.) Sw.; BLM0430; N; P; AQ  
*Leptochloa fusca* (L.) Kunth; BLM0511, HF0135;  
 N; A; DA  
*Leptochloa panicea* (Retz.) Ohwi ssp. *brachiata*  
 (Steudl.) N. Snow; HF0152, PC-192; N; P; DA  
*Muhlenbergia asperifolia* (Nees & Meyen ex Trin.)  
 Parodi; BLM0437; N; P; AQ  
*Nassella leucotricha* (Trin. & Rupr.) Pohl; BLM0195,  
 PC-4; N; P; MG  
*Neeragrostis reptans* (Michx.); PC-193; N; A; AQ  
*Panicum capillare* L.; HF0124, PC-160; N; A; DA  
*Panicum holli* Vasey var. *filipes* (Scribn.) F.R. Waller;  
 PC-169; N; P; MG  
*Panicum obtusum* H.B.K.; HF077, PC-156; N; P; BLF,  
 DA, MG  
*Panicum rigidulum* Bosc ex Nees; HF0122; N; P; MG  
*Panicum virgatum* L.; BLM0488, PC-199; N; P; BLF,  
 MG, MQ  
*Paspalum smithii* (Rydb.) A. Löve; BLM0486, PC-  
 62; N; P; AQ, BLF  
*Paspalum distichum* L.; HF0150; N; P; DA  
*Paspalum setaceum* Michx.; BLM0487; N; P; AQ  
*Pennisetum glaucum* (L.) R.Br.; BLM0429, HF0130;  
 I; A; DA, PS  
*Phalaris canariensis* L.; BLM0161; I; A; AQ  
*Phalaris caroliniana* Walt.; HF033; N; A; AQ, MG  
*Poa annua* L.; BLM047; I; A; DA  
*Poa arachnifera* Torr.; BLM041; N; P; BLF  
*Polypogon monspeliensis* (L.) Desf.; BLM0168; I; A;  
 AQ, SB  
*Schedonnardus paniculatus* (Nutt.) Trel.; HF050;  
 N; P; DA, MG  
*Setaria parviflora* (Poir.) Kerguelén; BLM0359; N;  
 P; DA  
*Setaria viridis* (L.) Beauv.; BLM0500; I; A; DA  
*Sorghastrum nutans* (L.) Nash; BLM0433; N; P; MG

*Sorghum halepense* (L.) Pers.; BLM0484, HF041,  
 PC-124; I; P; DA  
*Sporobolus airoides* (Torr.) Torr.; HF079, PC-182; N;  
 P; DA, SB  
*Sporobolus cryptandrus* (Torr.) A. Gray; BLM0326;  
 N; P; MG, SB  
*Sporobolus coromandelianus* (Retz.) Kunth; PC-  
 183; N; P; DA  
*Tridens albescens* (Vasey) Woot. & Standl.;  
 BLM049, HF063, PC-3; N; P; MG  
*Triplasis purpurea* (Walt.) Chapman; BLM0436; N;  
 A; SB  
*Vulpia octoflora* (Walt.) Rydb.; BLM059; N; A; MG

## POTAMOGETONACEAE

*Potamogeton nodosus* Poir.; 2084-BWH; N; P; AQ

## SMILACACEAE

*Smilax bona-nox* L.; BLM0446, PC-203; N; P; BLF  
*Smilax rotundifolia* L.; 071-98; N; P; BLF

## TYPHACEAE

*Typha domingensis* Pers.; BLM0375, PC-134; N; P;  
 AQ

## ZANNICHELLIACEAE

*Zannichellia palustris* L.; BLM030; N; P; AQ

## MAGNOLIOPSIDA

## AMARANTHACEAE

*Amaranthus palmeri* S. Wats.; HF091; N; A; DA  
*Amaranthus rudis* Sauer; BLM0438, HF115; N; A; DA

## ANACARDIACEAE

*Rhus trilobata* Nutt.; BLM0204; N; P; MG, MQ

## APIACEAE

*Ammoselinum papei* Torr. & A. Gray; HF067; N; A;  
 DA  
*Chaerophyllum tainturieri* Hook.; BLM048; N; A;  
 DA, MG  
*Cymopterus macrorhizus* Buckl.; PC-221; N; P; MG  
*Daucus pusillus* Michx.; BLM0154, HF053, PC-85;  
 N; A; DA  
*Eryngium leavenworthii* Torr. & A. Gray; PC-216; N;  
 A; MG  
*Hydrocotyle verticillata* Thunb.; BLM0502; N; P; AQ  
*Lomatium foeniculaceum* (Nutt.) Coult. & Rose;  
 PC-220; N; P; MG  
*Sanicula canadensis* L.; BLM0499; N; B; BLF

## ASCLEPIADACEAE

*Asclepias arenaria* Torr.; BLM0492; N; P; MG

*Asclepias asperula* (Dcne.) Woods; HF054, PC-143; N; P; DA, MG

*Asclepias viridiflora* Raf.; PC-187; N; P; DA, MG, MQ

*Asclepias viridis* Walter; PC-53; N; P; MG

*Funastrum cynanchoides* (Decne.) Schltr.; BLM0345, PC-186; N; P; DA

*Matelea biflora* (Raf.) Woods; HF054; N; P; DA, MG

## ASTERACEAE

*Achillea millefolium* L.; BLM042, HF022, PC-57; N; P; DA, MG, MQ

*Ambrosia psilostachya* DC.; BLM0352, HF0155, PC-176; N; P; DA, MG, MQ, SB

*Ambrosia trifida* L.; HF0149; N; A; DA

*Amphichyris dracunculoides* (DC.) Nutt.; BLM0439; N; A; DA

*Aphanostephus ramosissimus* DC.; BLM0201; N; A; SB

*Artemisia filifolia* Torr.; BLM0425; N; P; SB

*Baccharis salicina* Torr. & A. Gray; HF0107; N; P; BLF, DA, SB

*Berlandiera texana* DC.; M9.148; N; P; MG

*Bidens frondosa* L.; BLM0440; N; A; AQ

*Centaurea americana* Nutt.; 2126-BWH, PC-70; N; A; DA, MG

*Chloracantha spinosa* (Benth.) Nesom; BLM0370; N; P; BLF

*Chaetopappa ericoides* (Torr.) Nesom; BLM0157, PC-10; N; P; MG

*Cirsium ochrocentrum* A. Gray; HF0108; N; P; DA, MG

*Cirsium texanum* Buckley; HF094, PC-54; N; P; MG

*Cirsium undulatum* (Nutt.) Spreng.; BLM0177, HF030; N; P; DA, MG

*Conyza canadensis* (L.) Cronq.; HF014; N; A; DA

*Coreopsis tinctoria* Nutt.; HF040, PC-96; N; A; AQ, MG

*Dracopis amplexicaulis* (Vahl) Cass.; HF031, PC-84; N; A; AQ

*Dysodiopsis tagetoides* (Torr. & A. Gray) Rydb.; PC-80; N; P; DA, MG

*Echinacea angustifolia* DC.; PC-93; N; P; MG, MQ

*Eclipta prostrata* (L.) L.; HF164, BLM0453; N; A; AQ

*Engelmannia peristenia* (Raf.) Goodman & Lawson; BLM0152, HF059, PC-171; N; P; MG, MQ

*Erigeron strigosus* Muhl. ex Willd., HF018, PC-6; N; A; DA

*Eupatorium serotinum* Michx.; BLM0445; N; P; BLF, MG

*Evax prolifera* Nutt. ex DC.; PC-37; N; A; DA

*Gaillardia pulchella* Foug.; BLM0186; N; A; DA, MG, MQ

*Gaillardia souvis* (A. Gray & Engelm.) Britton & Rusby; BLM075, HF028, PC-17; N; P; DA, MG, MQ

*Grindelia nuda* A.W. Wood; PC-178; N; P; DA, MG, MQ

*Grindelia papposa* Neson & Suh; BLM00490; N; Bi; DA, MG, MQ

*Grindelia squarrosa* (Pursh) Dunal; HF0145; N; P; DA, MG, MQ

*Grindelia lanceolata* Nutt. var. *texana* (Scheele) Shinnery; PC-215; N; P; DA, MG

*Helenium microcephalum* DC.; HF081, PC-164; N; A; AQ, BLF

*Helianthus annuus* L.; HF087, PC-101; N; A; DA

*Helianthus petiolaris* Nutt.; BLM0329; N; A; DA, SB

*Heterotheca subaxillaris* (Lam.) Britton & Rusby; HF0109; N; A; DA, MG

*Heterotheca villosa* (Pursh) Shinnery; PC-142; N; P; MG, SB

*Hymenopappus flavescens* Gray; BLM0188; N; Bi; MG

*Hymenopappus scabieosus* L'Hér.; M9.147; N; Bi; MG, MQ

*Hymenopappus tenuifolius* Pursh.; BLM0324, PC-14; N; Bi; MG

*Hymenoxys odorata* DC.; HF061; N; A; DA, MG

*Iva annua* L.; BLM0442, HF0146, PC-213; N; A; AQ

*Lactuca ludoviciana* (Nutt.) Riddell; HF095; N; Bi; DA

*Liatris mucronata* DC.; BLM0342; N; P; MG

*Liatris punctata* Hook.; HF0162, PC-212; N; P; MG

*Lindheimera texana* Gray & Engelm.; PC-15; N; A; MG, MQ

*Machaeranthera pinnatifida* (Hook.) Shinnery; PC-179; N; P; MG

*Machaeranthera pinnatifida* (Hook.) Shinnery ssp. *pinnatifida* var. *pinnatifida*; BLM0187, HF074; N; P; MG, MQ

*Packera plattensis* (Nutt.) W.A. Weber & A. Löve; PC-13; N; P; BLF

*Pluchea odorata* (L.) Cass.; BLM0495; N; A; AQ, BLF

*Pyrrhopappus grandiflorus* (Nutt.) Nutt.; BLM043; N; P; DA

*Ratibida columnifera* (Nutt.) Wootton & Standl.; HF056, PC-88; N; P; DA, MG, MQ

*Senecio vulgaris* L.; PC-243; I; Bi; BLF

*Solidago missouriensis* Nutt.; BLM0353, PC-185; N; P; DA, MG, MQ

- Sonchus asper* (L.) Hill; BLM036, HF07; I; A; DA  
*Sonchus oleracea* L., 2088-BWH; I; A; DA  
*Symphytotrichum ericoides* (L.) Nesom; HF0156,  
 PC-181; N; P; MG, MQ  
*Symphytotrichum subulatum* (Michx.) Nesom,  
 BLM0454, HF023; N; A; AQ  
*Taraxacum officinale* G.H. Weber ex Wiggers; PC-  
 244; I; P; DA  
*Tetranneuris linearifolia* (Hook.) Greene; BLM058,  
 PC-11; N; A; MG  
*Tetranneuris scaposa* (DC.) Greene; BLM0174, PC-  
 9; N; P; MG  
*Thelaspisma filifolium* (Hook.) A. Gray; BLM0483,  
 PC-47; N; P; MG, MQ  
*Thelaspisma megapotaemicum* (Spreng.) Kuntze;  
 BLM0181; N; P; MG, MQ  
*Tragopogon dubius* Scop.; BLM0498, HF043; I; A;  
 DA  
*Vernonia marginata* (Torr.) Raf.; PC-166; N; P; MG  
*Xanthisma texanum* DC.; BLM9482; N; A; MG, SB  
*Xanthium strumarium* L.; BLM0349, HF0163, PC-  
 214; N; A; AQ

## BORAGINACEAE

- Buglossoides arvensis* (L.) I.M. Johnston; BLM0156;  
 I; A; DA  
*Heliotropium curassavicum* L.; BLM0343, HF099,  
 N; A; AQ, SB  
*Heliotropium tenellum* (Nutt.) Torr.; PC-106; N; A; MG  
*Lithospermum incisum* Lehm.; PC-236; N; P; MG

## BRASSICACEAE

- Capsella bursa-pastoris* (L.) Medik.; PC-249; I; A; DA  
*Descurainia pinnata* (Walt.) Britton; BLM038; N;  
 A; DA  
*Descurainia sophia* (L.) Webb ex Prantl; PC-237; I;  
 A; DA  
*Draba cuneifolia* Nutt. ex Torr. & A. Gray; PC-223;  
 N; A; DA, MG  
*Erysimum repandum* L.; PC-230; I; A; DA  
*Lepidium austrinum* Small; PC-24; N; A; DA  
*Lepidium densiflorum* Schrad.; HF034; N; A; DA  
*Lesquerella gordonii* (A. Gray) Wats.; BLM065; N; A;  
 MG  
*Lesquerella gracilis* (Hook.) S. Wats. subsp. *Nuttallii*  
 (T. & G.) Rollins & Shaw; PC-8; N; A; MG  
*Lesquerella gracilis* (Hook.) S. Wats.; PC-223; N; A;  
 MG  
*Lesquerella ovalifolia* Rydb.; PC-44; N; P; MG  
*Rorippa nasturtium-aquaticum* (L.) Hayek,  
 BLM035; I; P; AQ

- Sibara virginica* (L.) Rollins; PC-229; N; A; DA, MG  
*Sinapis arvensis* L.; HF016; I; A; DA

## CACTACEAE

- Escobaria vivipara* (Nutt.) Buxbaum; 1542-BWH;  
 N; P; MG  
*Opuntia leptocaulis* DC.; BLM027; N; P; MG  
*Opuntia macrohiza* Engelm.; BLM511, HF076; N;  
 P; DA, MG, MQ  
*Opuntia phaeacantha* Engelm. var. *major*  
 Engelm.; PC-49; N; P; DA, MG, MQ

## CAMPANULACEAE

- Lobelia cardinalis* L.; BLM0444; N; P; AQ  
*Tradantia perfoliata* (L.) Nieuwl.; BLM0155; N; A;  
 DA

## CAPPARACEAE

- Cleomella angustifolia* Torr.; 040-98; N; A; DA

## CARYOPHYLLACEAE

- Arenaria serpyllifolia* L.; PC-247; I; A; DA  
*Cerastium brachypodium* (Engelm. ex Gray) B.L.  
 Robins.; PC-224; N; P; DA  
*Paronychia jamesii* Torr. & A. Gray; BLM0494, PC-  
 205; N; P; MG  
*Stellaria media* (L.) Vill.; BLM056; I; A; DA

## CHENOPODIACEAE

- Chenopodium album* L.; HF090; I; A; DA  
*Chenopodium berlandieri* Moq.; HF0157, PC-189;  
 N; A; DA  
*Chenopodium pratericola* Rydb.; HF012; N; A; DA  
*Cycloloma atriplicifolium* (Spreng.) Coult.;  
 BLM0489; N; A; DA  
*Monolepis nuttalliana* (Schultes) Greene; HF017,  
 PC-238; N; A; DA  
*Salsola tragus* L.; PC-180; I; A; DA

## CONVOLVULACEAE

- Convolvulus arvensis* L.; HF086, PC-18; I; P; DA

## CORNACEAE

- Cornus drummondii* Mey.; 0132-98; N; P; DA, MG

## CUCURBITACEAE

- Cucurbita foetidissima* Kunth.; HF070, PC-131; N;  
 P; DA, MG, MQ

## ELATINACEAE

- Bergia texana* (Hook.) Walp.; PC-137; N; P; MG

## EUPHORBIACEAE

- Acalypha ostryifolia* Riddell; PC-188; N; A; DA  
*Argythamnia humilis* (Engelm. & A. Gray) Muell.,  
 Arg var. *leiosperma* Waterfall; PC-78; N; P; MG;

*Chamaesyce albomarginata* (Torr. & A. Gray) Small; HF096; N; P; DA

*Chamaesyce serpens* (Kunth) Small; HF089; N; A; DA

*Chamaesyce missurica* (Raf.) Shinnery; BLM0377, PC-125; N; A; DA

*Chamaesyce nutans* (Lag.) Small; PC-174; N; A; DA

*Chamaesyce prostrata* (Aiton) Small; PC-108; N; A; DA

*Cnidoscolus texanus* (Muell.-Arg.) Small; BLM0166; N; P; DA, SB

*Croton capitatus* Michx.; PC-152; N; A; DA, MG

*Croton monanthogynus* Michx.; PC-74; N; A; DA

*Croton texensis* (Klotzsch) Muell.-Arg.; BLM0428; N; A; DA, MG

*Euphorbia dentata* Michx.; PC-73; N; A; DA

*Euphorbia marginata* Pursh; BLM0347, HF0143, PC-35; N; A; DA, SB

*Euphorbia spathulata* Lam.; BLM050, PC-26; N; A; DA

*Phyllanthus polygonoides* Nutt. ex Spreng, PC-98; N; P; MG

*Stillingia sylvatica* Garden ex L.; BLM0203; N; P; MG

## FABACEAE

*Acacia angustissima* (Mill.) Kuntze. var. *hirta* (Nutt.) B.L. Rob.; HF093, PC-141; N; P; MG, MQ

*Amorpha fruticosa* L.; BLM0151; N; P; AQ

*Astragalus lindheimeri* Engel. ex A. Gray, PC-32; N; A; MG, MQ

*Astragalus plattensis* Nutt.; PC-28; N; P; MG, MQ

*Chamaecrista fasciculata* (Michx.) Greene; PC-204; N; A; MG, MQ

*Dalea aurea* Nutt. ex Pursh; PC-116; N; P; MG

*Dalea candida* Willd.; BLM0323, PC-122; N; P; MG, MQ

*Dalea enneandra* Nutt., BLM0321, PC-115; N; P; MG

*Dalea lanata* Spreng.; BLM0306; N; P; SB

*Dalea purpurea* Vent.; PC-91; N; P; MG, MQ

*Dalea villosa* (Nutt.) Spreng.; BLM0305; N; P; SB

*Desmanthus illinoensis* (Michx.) MacM.; BLM0344, HF0111; N; P; DA

*Gleditsia triacanthos* L.; BLM073; N; P; BLF

*Glycyrrhiza lepidota* Pursh; BLM0310; N; P; SB

*Hoffmannseggia glauca* (Ort.) Eifert; HF039, PC-147; N; P; DA

*Indigofera miniata* Ort. var. *leptosepala*; BLM0159, PC-206; N; P; SB

*Medicago minima* (L.) L.; PC-31; I; A; DA

*Medicago orbicularis* (L.) Bartal.; HF045; I; A; DA  
*Mellilotus officinalis* (L.) Lam.; BLM0485, HF027, PC-195; I; A; DA

*Mimosa nuttallii* (DC.) B.L. Turner; BLM0189, HF066, PC-90; N; P; MG, MQ

*Neptunia lutea* Benth.; PC-100; N; P; MG, MQ

*Pediomeum cuspidatum* (Pursh) Rydb.; PC-83; N; P; MG, MQ

*Pediomeum linearifolium* (Torr. & A. Gray) J. Grimes; PC-95; N; P; MG, MQ

*Prosopis glandulosa* Torr.; BLM0176, HF068, PC-64; N; P; DA, MG, MQ

*Vicia sativa* L.; BLM053; I; A; DA

## GENTIANACEAE

*Eustoma exaltatum* (L.) Salisb. ex G. Don; BLM0341, PC-202; N; A; AQ

## GERANIACEAE

*Erodium cicutarium* (L.) L'Hér. ex Aiton; BLM063, PC-240; I; A; DA

*Geranium carolinianum* L.; 2087-BWH, HF049; N; A; DA

## HYDROPHYLLACEAE

*Nama hispida* Gray; BLM0153; N; A; MG

## KRAMERIACEAE

*Krameria lanceolata* Torr.; BLM0167, HF057, PC-81; N; P; MG, MQ

## LAMIACEAE

*Hedeoma reverchonii* A. Gray; PC-126; N; P; MG, MQ

*Lamium amplexicaule* L.; BLM074, PC-239; I, A, BLF, DA

*Monarda clinopodioides* A. Gray; BLM0197, PC-69; N; A; DA, MG

*Scutellaria drummondii* Benth.; PC-105; N; A; MG

*Scutellaria resinosa* Torr.; PC-5; N; P; MG

*Teucrium canadense* L.; BLM0331, PC-129; N; P; BLF

*Teucrium laciniatum* Torr.; BLM0149, HF055, PC-30; N; P; MG, MQ

## LINACEAE

*Linum perenne* L.; BLM069; I; P; MG, MQ

*Linum pratense* (J.B.S. Norton) Small; PC-103; N; A; MG, MQ

## LOASACEAE

*Mentzelia nuda* (Pursh) Torr. & A. Gray var. *stricta* (Osterhout) Harrington; BLM0325; N; P; SB

*Mentzelia oligosperma* Nutt. ex Sims.; PC-121; N; P; MG

**LYTHRACEAE**

- Lythrum alatum* Pursh; HF04; N; P; AQ  
*Lythrum californicum* Torr. & A. Gray; PC-130; N; P;  
 AQ

**MALVACEAE**

- Malvella leprosa* (Ortega) Krapov.- HF03; N; P; DA  
*Sphaeralcea coccinea* (Nutt.) Rydb.; PC-7; N; P; MG,  
 MQ

**MENISPERMACEAE**

- Cocculus carolinus* (L.) DC.; BLM0309; N; P; DA

**MOLLUGINACEAE**

- Mollugo verticillata* L.; HF075; N; A; DA

**MORACEAE**

- Maclura pomifera* (Raf.) Schneid.; BLM0318,  
 HF069; N; P; BLF, DA  
*Morus alba* L.; BLM0507, HF0117; I; P; DA

**NYCTAGINACEAE**

- Abronia fragrans* Nutt. ex Hook.; BLM057; N; P; SB  
*Mirabilis albidia* (Walt.) Heimerl; BLM0172, PC-162;  
 N; P; SB  
*Mirabilis jalapa* L.; HF0153; I; P; DA  
*Mirabilis linearis* (Pursh) Heimerl; HF072; N; P; MG,  
 MQ

**OLEACEAE**

- Fraxinus pennsylvanica* Marsh; PC-150; N; P; BLF

**ONAGRACEAE**

- Calylophus hartwegii* (Benth.) Raven subsp.  
*pubescens* (A. Gray) Towner & Raven; PC-33;  
 N; P; MG  
*Calylophus serrulatus* (Nutt.) Raven; BLM0202; N;  
 P; MG, SB  
*Gaura coccinea* Nutt. ex Pursh; BLM066, HF044;  
 N; P; MG, SB  
*Gaura parviflora* Dougl. ex Lehm.; PC-191, HF025;  
 N; A; DA  
*Gaura sinuata* Nutt. ex Ser.; PC-158; N; P; MG, MQ  
*Ludwigia peploides* (Kunth) Raven; 2089-BWH; N;  
 P; AQ  
*Ludwigia repens* J.R. Forst.; BLM0198; N; P; AQ  
*Oenothera grandis* Britton; BLM080, 062-97, PC-  
 1; N; A; MG, SB  
*Oenothera rhombipetala* Nutt. ex Torr. & A. Gray;  
 BLM0378; N; Bi; DA, SB  
*Oenothera speciosa* Nutt.; HF037, PC-34; N; P; DA,  
 MG  
*Oenothera triloba* Nutt.; M9.026; N; Bi; MG, MQ

- Stenosiphon linifolius* (Nutt. ex James) Heynh.;  
 BLM0361, PC-89; N; P; DA, MG, MQ

**OXALIDACEAE**

- Oxalis corniculata* L.; PC-246; N; P; DA

**PAPAVERACEAE**

- Argemone polyanthemus* (Fedde) G.B. Ownbey;  
 BLM0185; N; A; SB

**PEDALIACEAE**

- Proboscidea louisianica* (P. Mill) Thell.; HF088, PC-  
 211; N; A; DA

**PLANTAGINACEAE**

- Plantago rhodosperma* Decne.; BLM079, PC-25; N;  
 A; DA, MG

**POLYGALACEAE**

- Polygala alba* Nutt. BLM0148, PC-48; N; P; MG

**POLYGONACEAE**

- Eriogonum annuum* Nutt.; BLM0354; N; A; SB  
*Eriogonum longifolium* Nutt.; PC-175; N; P; MG  
*Polygonum hydropiperoides* Michx.; BLM0422; N;  
 P; AQ  
*Polygonum lapathifolium* L.; HF0148; N; A; AQ  
*Polygonum pennsylvanicum* L.; HF024; N; A; AQ  
*Polygonum ramosissimum* Michx.; HF0160; N; A;  
 DA  
*Rumex altissimus* Wood; HF021; N; P; AQ, DA  
*Rumex crispus* L.; HF05; I; P; AQ, DA, BLF

**PORTULACACEAE**

- Portulaca oleracea* L.; HF0137; N; A; DA

**PRIMULACEAE**

- Androsace occidentalis* Pursh; PC-248; N; A; DA  
*Samolus ebracteatus* Kunth; BLM0184; N; P; AQ  
*Samolus valerandi* L.; BLM0503; N; P; AQ

**RANUNCULACEAE**

- Anemone berlandieri* Pritz; PC-23; N; P; MG  
*Anemone caroliniana* Walt.; PC-227; N; P; DA, MG  
*Delphinium carolinianum* Walt. ssp. *virescens*  
 (Nutt.) Brooks; PC-20; N; P; MG, MQ  
*Myosurus minimus* L.; PC-234; N; A; AQ  
*Ranunculus sceleratus* L.; BLM034; N; A; AQ

**RHAMNACEAE**

- Ziziphus obtusifolia* (Hook.) A. Gray; BLM0158; N;  
 P; MG

**ROSACEAE**

- Crataegus viridis* L.; M9.129; N; P; BLF

*Prunus angustifolia* Marshall; HF052, PC-139; N; P; DA, MG

*Rubus trivialis* Michx.; BLM037; N; P; BLF

## RUBIACEAE

*Cephalanthus occidentalis* L.; PC-119; N; P; AQ

*Galium aparine* L.; BLM039; N; A; BLF

*Hedyotis nigricans* (Lam.) Fosberg; BLM0191, PC-82; N; P; MG

*Houstonia pusilla* Schoepf; PC-226; N; A; DA

## RUTACEAE

*Zanthoxylum hirsutum* Buckl.; BLM0160; N; P; SB

## SALICACEAE

*Populus deltoides* Marsh. ssp. *monilifera* (Alton) Eckenw.; PC-19; N; P; BLF

*Populus deltoides* Bartr. ex Marsh.; HF0128, PC-251; N; P; BLF

*Salix exigua* Nutt.; BLM0308; N; P; SB

*Salix nigra* Marsh.; BLM0314, HF029, PC-120; N; P; AQ, BLF, SB

## SAPINDACEAE

*Cardiospermum halicacabum* L.; BLM0339; N; A; BLF, DA

*Sapindus saponaria* L. var. *drummondii* (Hook. & Arn.) L.D. Benson; HF026, PC-149; N; P; BLF, SB

## SAPOTACEAE

*Sideroxylon lanuginosum* Michx.; BLM0173, PC-207; N; P; SB

## SCROPHULARIACEAE

*Lindernia dubia* (L.) Pennell; M9.136; N; A; AQ

*Penstemon cobaea* Nutt.; PC-51; N; P; MG

*Veronica anagallis-aquatica* L.; BLM052; N; P; AQ

*Veronica peregrina* L.; BLM081; N; A; DA

## SIMAROUBACEAE

*Ailanthus altissima* (P. Mill.) Swingle; 0489-98; I; P; DA

## SOLANACEAE

*Chamaesaracha coniodes* Moric. ex Dunal; PC-58; N; P; DA

*Physalis angulata* L.; HF0123; N; A; DA

*Physalis longifolia* Nutt.; BLM0351, PC-97; N; P; DA

*Physalis mollis* Nutt. var. *mollis*; HF0133, PC-167; N; P; DA

*Quincula lobata* (Torr.) Raf.; HF013, PC-52; N; P; DA; MQ

*Solanum dimidiatum* Raf.; BLM0153, PC-87; N; P; DA

*Solanum elaeagnifolium* Cav.; BLM0169, PC-50; N; P; DA, MG

*Solanum rostratum* Dunal; BLM0493, HF092; N; A; DA

## TAMARICACEAE

*Tamarix chinensis* Lour.; HF020, PC-198; I; P; AQ, SB

## ULMACEAE

*Celtis laevigata* Willd. var. *texana* (Scheele) Sang.; HF080, PC-110; N; P; BLF, SB

*Ulmus americana* L.; BLM0337, PC-253; N; P; BLF

## URTICACEAE

*Parietaria pensylvanica* Muhl. ex Willd.; BLM0170; N; A; BLF

## VALERIANACEAE

*Valerianella radiata* (L.) DuRoi; BLM083; N; A; DA

## VERBENACEAE

*Phyla lanceolata* (Michx.) Greene; BLM0199; N; P; AQ

*Phyla nodiflora* (L.) Greene; BLM0330, PC-127; N; P; AQ

*Glandularia bipinnatifida* (Nutt.) Nutt.; PC-12; N; A; DA

*Verbena plicata* Greene; BLM060; N; P; MG

*Verbena scabra* Vahl; BLM0423; N; P; MG

## VIOLACEAE

*Viola bicolor* Pursh; PC-225; N; A; DA

## VISCACEAE

*Phoradendron tomentosum* (DC.) Engelm. ex A. Gray; BLM0164, PC-250; N; P; BLF

## VITACEAE

*Ampelopsis cordata* Michx.; BLM0362; N; P; BLF

*Cissus trifoliata* (L.) L.; BLM072; N; P; MG

*Parthenocissus quinquefolia* (L.) Planch.; BLM0350; N; P; BLF

*Vitis acerifolia* Raf.; 0134-98; N; P; SB

*Vitis riparia* Michx.; 093-98; N; P; SB

*Vitis vulpina* L.; PC-208; N; P; MG, MQ

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